

WHAT IS CLAIMED IS:

1. A phase correction circuit for a disk reproduction device, comprising:

channel clock generation means for generating a channel clock whose phase synchronizes with that of record data, from a disk-type recording medium in which clock marks showing phase information are preformatted and the record data and a fixed pattern whose phase synchronizes with that of the record data are recorded in each sector, by using a reproduction signal of the clock marks;

phase difference detection means for detecting a phase difference between a phase of a reproduction signal of the fixed pattern and the phase of the channel clock generated by the channel clock generating means;

phase control data generation means for judging whether or not a present sector is a leading sector in a minimum recording unit in the disk-type recording medium, and generating phase control data by referring to a phase difference data of a previous sector when the present sector is not the leading sector, based on the phase difference data detected by the phase difference detection means; and

phase control means for generating a sampling clock whose phase synchronizes with that of the record data,

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by controlling the phase of the channel clock based on an output of the phase control data generation means.

2. The phase correction circuit for a disk reproduction device as set forth in claim 1, wherein:

when the present sector is the leading sector in the minimum recording unit, the phase control data generation means generates the phase control data by using a phase difference amount indicated by a phase difference data outputted by the phase difference detection means, and when the present sector is not the leading sector in the minimum recording unit, the phase control data generation means generates the phase control data from an average data of the phase difference data of the previous sector and the phase difference data of the present sector.

3. The phase correction circuit for a disk reproduction device as set forth in claim 2, wherein the phase control data generation means includes:

a shift register for storing respective phase difference data of the sectors from a sector which is a predetermined number of sectors before the present sector to the present sector;

an average circuit for calculating an average value of the respective phase difference data stored in the

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shift register; and

a first selector which selects the phase difference data of the present sector when the present sector is the leading sector, selects an output of the average circuit when the present sector is not the leading sector, and outputs the selected one.

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4. The phase correction circuit for a disk reproduction device as set forth in claim 3, comprising a second selector which selects a predetermined value when the fixed pattern is reproduced, selects an output of the first selector at other times, and outputs the selected one.

5. The phase correction circuit for a disk reproduction device as set forth in claim 1, wherein:

when the present sector is the leading sector in the minimum recording unit, the phase control data generation means generates the phase control data by using a phase difference amount indicated by a phase difference data outputted by the phase difference detection means, and when the present sector is not the leading sector in the minimum recording unit, the phase control data generation means generates the phase control data based on a value obtained by multiplying the phase difference amount

indicated by the phase difference data by a coefficient not more than 1.

6. The phase correction circuit for a disk reproduction device as set forth in claim 5, wherein the phase control data generation means includes:

a multiplier for multiplying the phase difference data of the present sector by the coefficient;

a register for holding and outputting an input in a sector which is one sector before the present sector;

an adder for adding an output of the multiplier and an output of the register; and

a first selector which selects the phase difference data of the present sector when the present sector is the leading sector, selects an output of the adder when the present sector is not the leading sector, and outputs the selected one to the register.

7. The phase correction circuit for a disk reproduction device as set forth in claim 6, comprising a second selector which selects a predetermined value when the fixed pattern is reproduced from the leading sector, selects the output of the register at other times, and outputs the selected one.

8. The phase correction circuit for a disk reproduction device as set forth in claim 1, wherein:

when the present sector is the leading sector in the minimum recording unit, the phase control data generation means generates the phase control data by using a phase difference amount indicated by a phase difference data outputted by the phase difference detection means, and when the present sector is not the leading sector in the minimum recording unit, the phase control data generation means compares the phase difference data of the previous sector with the phase difference data of the present sector, and when a difference between the phase difference data of the previous sector and the phase difference data of the present sector is greater than a predetermined value, the phase control data generation means generates the phase control data based on the phase difference data of the previous sector.

9. The phase correction circuit for a disk reproduction device as set forth in claim 8, wherein the phase control data generation means includes:

a register for holding and outputting an input in a sector which is one sector before the present sector;

a calculator for calculating an absolute value of a difference between an output of the register and the

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phase difference data of the present sector;

a comparator for comparing an output of the calculator with a predetermined value; and

a first selector which selects the phase difference data of the present sector when the present sector is the leading sector, regardless of an output of the comparator; selects the output of the register when the present sector is not the leading sector and moreover the output of the calculator is judged by the comparator to be more than the predetermined value; selects the phase difference data of the present sector at other times; and outputs the selected one to the register.

10. The phase correction circuit for a disk reproduction device as set forth in claim 9, comprising a second selector which selects a predetermined value when the fixed pattern is reproduced, selects the output of the register at other times, and outputs the selected one.

11. The phase correction circuit for a disk reproduction device as set forth in claim 1, wherein the phase difference detection means includes:

sampling means for sampling the reproduction signal of the fixed pattern in synchronization with the sampling

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clock;

zero-crossing judgment means for judging a presence or an absence of a zero-crossing of the reproduction signal based on a sampling result of the sampling means; and

detection means for detecting a phase difference between the sampling clock and the reproduction signal, based on a first sampling result before the zero-crossing and a second sampling result after the zero-crossing.

12. The phase correction circuit for a disk reproduction device as set forth in claim 11, wherein:

the detection means detects δ which is defined as:

$$\delta = (360^\circ \times |\alpha|) / (|\alpha| + |\beta|) - 180^\circ,$$

where α is the first sampling result, and β is the second sampling result, as the phase difference.

13. The phase correction circuit for a disk reproduction device as set forth in claim 11, wherein:

the phase difference detection means includes a shift average circuit for averaging phase differences at a predetermined number of the zero-crossings in the fixed pattern.

14. The phase correction circuit for a disk

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reproduction device as set forth in claim 13, wherein:

the number of the zero-crossings is determined at a number virtually identical to a number of zero-crossings of the fixed pattern.

15. A disk reproduction device including the phase correction circuit as set forth in claim 1.